Amphibian Use of Seeps in Headwater Landscapes

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As part of an adaptive management program for new forest practice rules, we studied physical and vegetative characteristics and amphibian occupancy patterns of seeps, stream reaches, and adjacent uplands in 29 non-fishbearing basins located in managed forestland of southwestern Washington during 2000-2002. Seeps, relatively uncommon features on the landscape, ranged in size from 2-2600 m^2, occurred at densities of 0-1.4/ha and were frequently (> 80%) located ≤ 30 m from stream channels. Seeps had more finer-grained substrates than reaches, and had less tree canopy and more hydrophilic plant species than adjacent upland habitat. Based on a single sampling of basins during the low-flow (August-October) period each year, pre-metamorphic amphibians were significantly less frequent in seeps than in reaches, whereas except for the Columbia torrent salamander, post-metamorphic amphibians were more common in seeps than in reaches. Pre- and post-metamorphic life stages tending to use different habitats suggests that seep presence offers greater habitat options. Torrent salamanders, easily the most abundant headwater amphibian, represented > 60% of amphibians found. Based on non-destructive sampling in 2000-1, all other amphibians were infrequent, but more thorough (albeit disruptive) sampling in 2002 revealed greater amphibian richness and higher abundances of cryptic taxa: lungless salamanders and post-metamorphic giant salamanders and stillwater-breeding amphibians. Amphibian density also varied inversely with seep size, which may reflect seasonal shrinkage of seeps. Repeated within-season sampling will be needed to clarify several patterns, but this approach may require new techniques that help ensure detection without altering habitat.

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